ANALYTIC SYSTEMS

Power Conversion Solutions

INSTALLATION & OPERATION MANUAL

VTC605 SERIES VOLTAGE CONVERTER

VOLTAGE CONVERTER IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS — This manual contains important safety and operating instructions for the voltage converter.

VOLTAGE CONVERTER PRECAUTIONS

1. Do not expose the voltage converter to rain or snow unless it is a sealed model.
2. Use of an attachment not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
3. Do not disassemble the voltage converter; return it to the manufacturer or an authorized service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire. Voltages of up to 350 volts are present inside the voltage converter anytime it is connected to input power, even if it is switched off.
4. To reduce risk of electric shock, unplug the voltage converter from the DC power source before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
5. Never place the voltage converter directly above a battery; gases from battery will corrode and damage the voltage converter.
6. Never allow battery acid to drip on the voltage converter.

Medical Equipment Notice

Analytic Systems does not recommend the use of their products in life support applications where failure or malfunction of this product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness. Analytic Systems does not recommend the use of any of its products in direct patient care. Examples of devices considered to be life support devices are neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), auto-transfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators for both adults and infants, anesthesia ventilators, and infusion pumps as well as any other devices designated as “critical” by the U.S. FDA.

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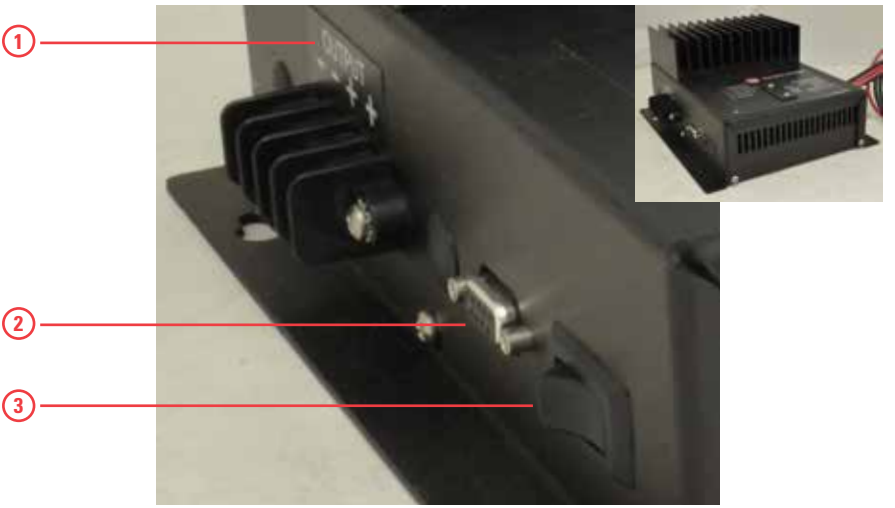
Revised - May 29, 2017

Introduction

Step up a 12 VDC battery to between 13.5 and 17.0 or 24.0 and 27.5 VDC in 0.5 VDC increments (via 3 position DIP switch), or stabilize a 12 or 24 VDC power system. Safety features include reverse input protection, low input voltage alarm, low output voltage alarm, over temperature shutdown and alarm, and output overvoltage crowbar. If the input voltage exceeds the regulated output voltage, the unit simply passes the voltage through with full LC filtering and a single schottky diode drop (0.5 VDC or less). Optional features include a dry contact alarm relay output, and remote panel monitoring with On/Off control.

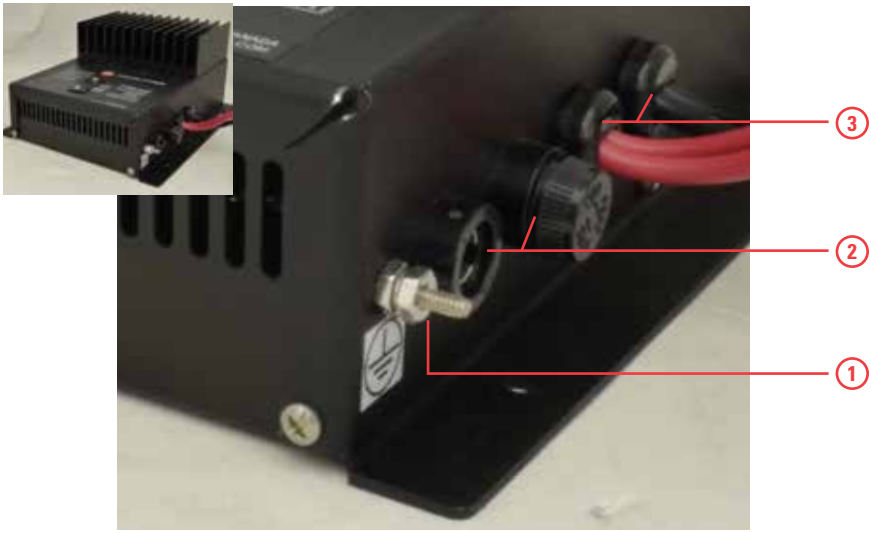
Applications include temporarily brightening 12 volt headlights or work lights, increasing voltage into an automotive or marine ignition system for hotter spark and/or prevention of failures due to voltage drop during engine start, stabilizing 12 and 24 VDC power systems in marine, automotive or aeronautical environments and more.

Main Parts



Left Side of Chassis

1. Output Connections
2. Remote Control Connector
3. On/Off Switch



Right Side of Chassis

1. Ground Stud
2. Input Fuses (2x)
3. Input Wires, 2x Positive and 2x Negative

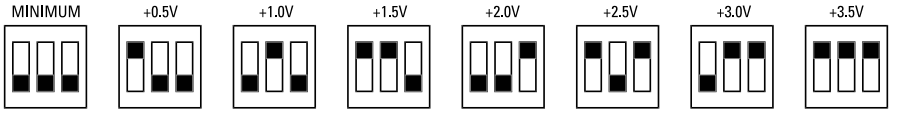
Top of Chassis

1. Indicator LEDs
2. Output Voltage Adjust DIP Switches

Operation

To turn the unit on, simply press the Power push button. The alarm buzzer will sound and the Low Output LED will come on briefly, and then the green OUTPUT ON LED will illuminate. The unit will provide the regulated voltage from no load to the maximum load shown in the specifications section. You may check this voltage at the output terminals of the unit with a good digital voltmeter.

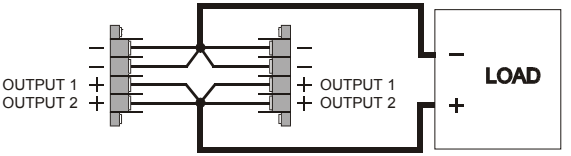
Output Voltage Adjustment



BLACK PORTION INDICATES SWITCH IS PUSHED DOWN

To adjust the output voltage, turn off the power switch. Remove the plate from the top of the box. Reach in with a non-conductive device such as a pencil and open or close the dip switches as shown below to select the desired output voltage. Replace the plate. Turn the power switch on.

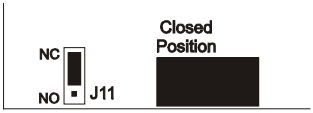
Load Share Option (D Option)

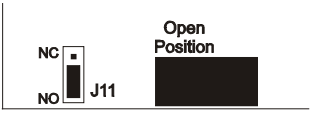


Two or more units may be configured for load sharing if they are equipped with the optional output isolation diodes. Connect a one foot piece of red wire of the appropriate gauge from each positive output terminal to a common connection point to further assist in even load sharing. Set each voltage converter for the same output voltage.

Dry Contact Relay

The relay is factory preset to fail closed when the low output LED and buzzer come on. If your system detects an alarm condition when the voltage converter is operating normally, you must take the bottom cover off the unit and move the jumper on J11 (located next to the dry contact relay) to opposite position as follows:





1. Disconnect the input power from the unit.
2. Turn the power switch ON to discharge the internal storage capacitors
3. Turn the unit over and remove the 4 cover screws.
4. Move the jumper on J11 to the opposite position
5. Reassemble the unit
6. Making sure the power switch is OFF, reconnect the input power
7. Turn the power switch on and check for proper operation of the dry contact relay.

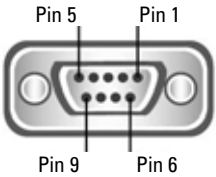
Remote Control

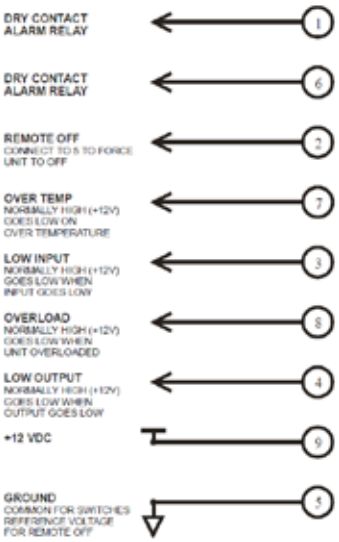
A model RCP1-VTL Remote Control panel may be connected to the voltage converter using the 9-pin D-connector on the left side of the voltage converter. The remote control panel allows the unit to be operated remotely as well as duplicating all the diagnostic indicators and audible alarm.

IMPORTANT: This remote is to be used only with Voltage Converters manufactured by Analytic Systems

REMOTE CONNECTOR

This connector is located on the left side of the unit. Important: The function of each pin is shown in the table, and the location of each pin in the connector in the diagram below.

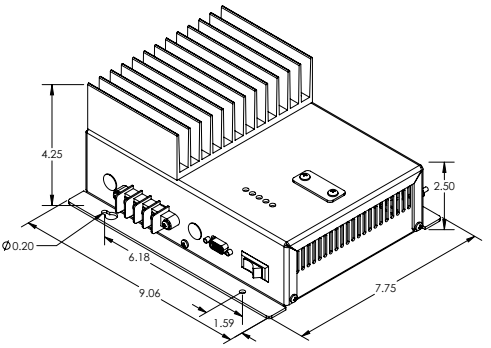




Installation

Mounting

Mount the unit and allow at least 1 inch of clearance around the heat sink fins for adequate cooling.



Input Connection

This unit is equipped with 2 pairs of AWG10 input leads approximately 1.0 meter in length for connection to the DC power source rated for at least 60 Amps. Red is Positive and Black is Negative. If the input leads need to be extended, use at least AWG10 wire for each lead.

Output Connections

Two positive output terminals and two negative output terminals are provided. Connect only one wire to each terminal. Ensure that the total average load connected does not exceed the continuous current rating of the unit.

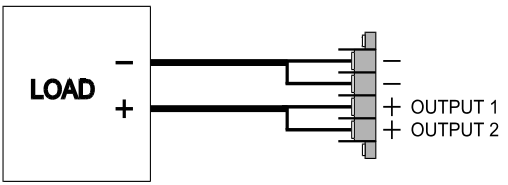
Note that the current specifications are for input current. To obtain the maximum output current capability at any given input voltage, use the following formula:

Output Current = Input Volts / Output Volts x 45

For example:

10 VDC in and 27 VDC out, the max output current = 10/27 x 45 = 16.7 Amps.
20 VDC in and 27 VDC out, the max output current = 20/27 x 45 = 33.3 Amps

Each output terminal is rated for 25 Amps, so do not connect more than 25 amps of load to either output terminal. If the load exceeds 25 Amps but not the continuous rated output of the unit, the output terminals must be connected to the load in parallel ensuring that the wiring used has sufficient capacity to handle the current.



Troubleshooting

This unit provides LED indicators and a buzzer to help diagnose any problems. The unit should sound the buzzer to alert you prior to shutting itself down. You should immediately check the indicators to determine the cause of the shutdown.

OVERLOAD	Indicates that the load connected to the voltage converter exceeds the continuous rating.
LOW OUTPUT	Indicates that the output voltage is below normal because:
	The current demanded by the devices connected to the unit exceeds the maximum output current rating, causing the output voltage to drop to maintain the current at the maximum level.
	The input voltage is not high enough for unit to operate.
LOW INPUT	Indicates that the input voltage is below normal because:
	The input voltage is not in the correct range for proper operation of the unit.
OVERTEMP	Indicates that the Voltage Converter is running too hot because:
	The Voltage Converter is located in a poorly ventilated area or the ambient temperature is too high.
	If the voltage converter gets too hot, the temperature sensor inside the unit will turn off the outputs. After the unit cools sufficiently, it will automatically come back on. If this happens frequently, remount the unit for increased airflow so it cools better.

Specifications

Input Voltages	-12	-24
Input Volts Actual	10.5 - 14.0 VDC	21 - 28 VDC
Input Amps	50 Amps Max	
Input Fuse - 1/4 x 1 1/4	2 x AGC 30 Amps in parallel	
Noise on Input	< 50 mV	

Output Voltages	-12	-24
Output Volts Actual	(Input – 1V) or 13.5 - 17.0 VDC Whichever is greater	(Input – 1V) or 24.0 - 27.5 VDC Whichever is greater
Output Amps	*45	

* The actual output current capability depends on the input/output voltage ration. To obtain the actual output current capability use the following formula: Output Amps = Input Volts/Output Volts x 45
For example, at 11 VDC In and 13.6 VDC Out, the output current = 11/13.6x45=36.4 Amps Max.

Output Overvoltage Protection Crowbar	Programmed Output x 1.3 Volts
Low Output Voltage Alarm	Programmed Output x 0.75 Volts
Ripple and Noise	< 100 mV Peak to Peak
Transient Response	< 1V for 50% Step Load
Regulation (Line and Load)	< +/- 0.5%
Efficiency	> 90% @ Maximum Output

Mechanical	
Dimensions	9.1 in / 23.1 cm Long x 7.8 in/ 19.8 cm Wide x 4.3" / 10.9 cm High
Clearance	1.0 in / 2.5 cm all around
Weight	6.0 lb / 2.7 kg
Material and Finish	Marine Grade Black Anodized Aluminum with 18-8 Stainless Fasteners
Mounting	Wall or Shelf Mount
Connections	Input: Flying Leads – Red & Black, 4 ft / 1.25 m length, 2 x 10 AWG Output: Beau 4 position terminal block, 2 positive, 2 negative

Environmental and Safety	
Operating Temperature Range	-25°C to +40°C @ maximum output. Derate Linearly 2.5% per °C from 40°C (Optional -40 to +55 °C wide temperature operation available)
Humidity	0 - 95% Relative Humidity (non-condensing) with standard conformal coating
Emissions	Meets FCC Part 15, Class B
Isolation	Input-Output Common Negative, Input-Case and Output-Case 500 VDC
Audible Noise	None, Convection Cooled
Typical Service Life	> 10 years (87,600 hrs)
Warranty	Three years parts and labor
Safety	Built to meet CSA 22.2.107.1 & UL458

Limited Warranty

1. The equipment manufactured by Analytic Systems Ware (1993) Ltd. (the "Warrantor") is warranted to be free from defects in workmanship and materials under normal use and service.
2. This warranty is in effect for:
    a. 3 Years from date of purchase by the end user for standard products offered in our catalog.
    b. 2 Years from date of manufacture for non-standard or OEM products
    c. 1 Year from date of manufacture for encapsulated products.
3. Analytic Systems will determine eligibility for warranty from the date of purchase shown on the warranty card when returned within 30 days, or
    a. The date of shipment by Analytic Systems, or
    b. The date of manufacture coded in the serial number, or
    c. From a copy of the original purchase receipt showing the date of purchase by the user.
4. In case any part of the equipment proves to be defective, the Purchaser should do the following:
    a. Prepare a written statement of the nature of the defect to the best of the Purchasers knowledge, and include the date of purchase, the place of purchase, and the Purchasers name, address and telephone number.
    b. Call Analytic Systems at 800-668-3884 or 604-946-9981 and request a return material authorization number (RMA).
    c. Return the defective part or unit along with the statement at the Purchasers expense to the Warrantor; Analytic Systems Ware (1993) Ltd., 8128 River Way, Delta, B.C., V4G 1K5, Canada.
5. If upon the Warrantor's examination the defect proves to be the result of defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense by the most economical means. Requests for a different method of return or special handling will incur additional charges and are the responsibility of the Purchaser.
6. Analytic Systems reserves the right to void the warranty if:
    a. Labels, identification marks or serial numbers are removed or altered in any way.
    b. Our invoice is unpaid.
    c. The defect is the result of misuse, neglect, improper installation, environmental conditions, non-authorized repair, alteration or accident.
7. No refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so.
8. Only the Warrantor shall perform warranty service. Any attempt to remedy the defect by anyone else shall render this warranty void.
9. There shall be no warranty for defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically stated to be waterproof.
10. No other express warranty is hereby given and there are no warranties that extend beyond those described herein. This warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, or any other obligations on the part of the Warrantor or its employees and representatives.
11. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any person or persons, or damage to property, or loss of income or profit, or any other consequential or resulting damage which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure of malfunction of the equipment, or part thereof.
12. The Warrantor assumes no liability for incidental or consequential damages of any kind

DESIGNED AND MANUFACTURED BY

ANALYTIC SYSTEMS
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Battery Chargers • Inverters • Power Supplies • Voltage Converters

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